New York City College of Technology

MAT1272   Practice EXAM III Halleck   Spring 2014

Show all work. For all problems, to receive any credit, you **must** draw a diagram for the distribution with enough detail that it will serve as a check for your answer and with **both** X and Z axes.

1. (40 points) The scores of an exam were normally distributed with a mean of 67 and a standard deviation of 18. The following chart shows percentiles for student grades (e.g., a student who scores better than at least 10% of his or her fellow students but less than 30% will receive a D):

percentile	0-9	10-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
grade	F	D	C	C+	B-	B	B+	A-	A

   a. What is the probability that a random score is between 45 and 75? (Hint: do NOT use the percentile chart.)
   b. If Sally's score was at the 35th percentile, what was it numerically and as a letter grade?
   c. To get a C, Jack must have what score at a minimum?
   d. Jill thought she got an A but instead got a B+. Jill must have scored below what value?

2. (30 points) The height of an adult male black bear is normally distributed with a mean of 30 inches and standard deviation of 3 inches.
   a. If a male bear is selected at random, what is the probability that his height is above 34 inches?
   b. If a sample of 36 male bears is selected at random, what is the probability that their average height is above 34 inches?
   c. How many male bears must be selected so that there is only a 1% chance that the average will be above 34 inches?

3. (30 points) Light-Bulbs-R-us (LIBRUS) says that the average life of their Bright light bulb is at least 1000 hours with standard deviation 240 hours. The Consumer Truth Organization (CTO) selects 36 bulbs and finds their average lifespan is 950 hours. Can CTO question LIBRUS's claim? (Use a 5% level of significance.) [Make sure to state the null and alternative hypothesis clearly.]